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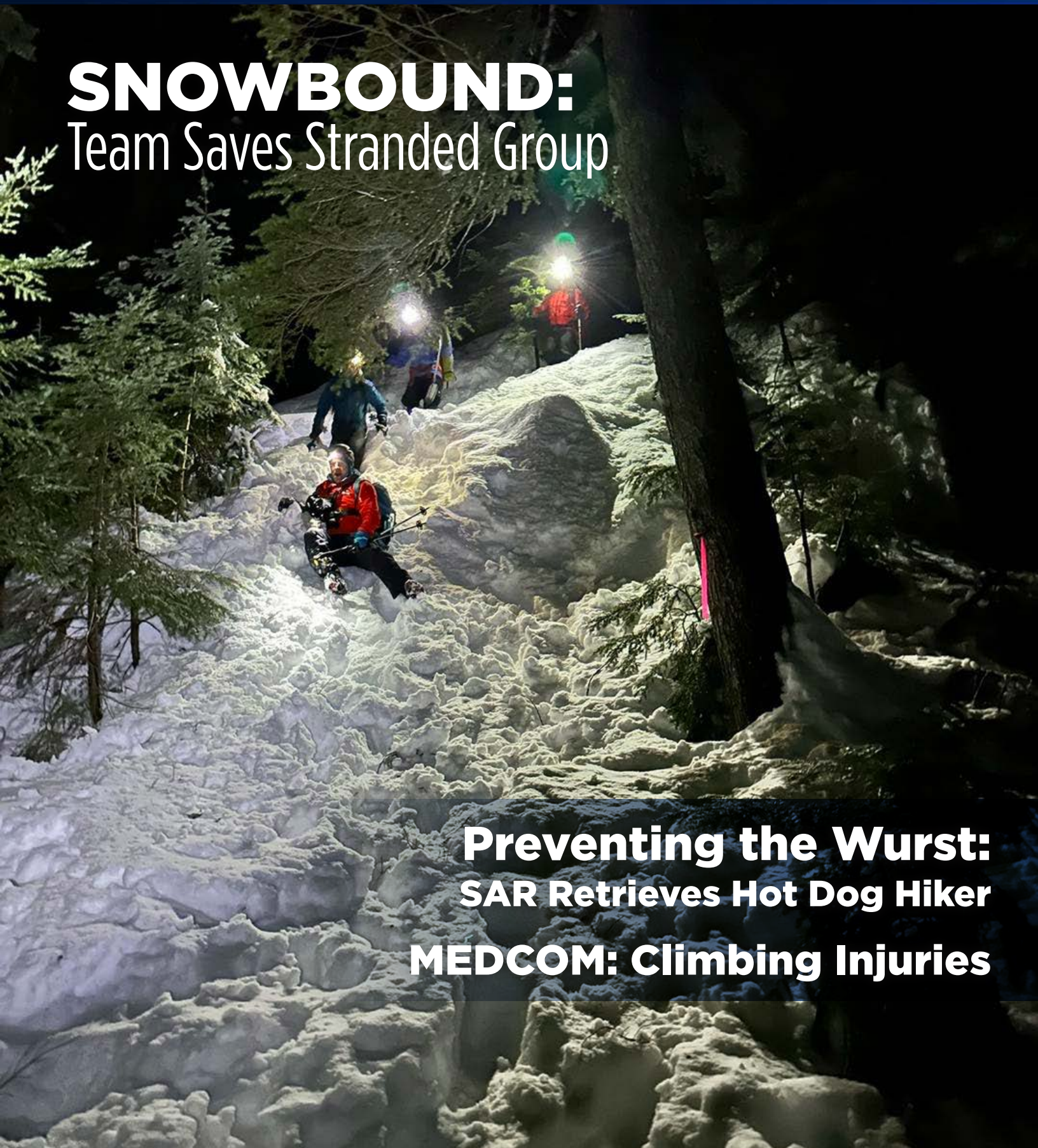
Summer 2023



The Quarterly Publication of the Mountain Rescue Association

mra.org

SNOWBOUND: Team Saves Stranded Group



Preventing the Worst:
SAR Retrieves Hot Dog Hiker
MEDCOM: Climbing Injuries



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Summer 2023

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ON THE COVER: Members of North Shore Rescue hike through snow during the rescue of five hikers near Vancouver, B.C. (NSR)



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President's Message

Saving lives is not easy work. And yes, mountain rescue is about saving lives. You all know the difficulties- the anxious call outs, the search before the rescue, the long approaches, operating technical systems in the dark, the blood, and sometimes worse. Then there is paperwork, training, recruitment, equipment maintenance, the budget and all the other administrative work that is just as crucial to a high-performing team.

As we ease out of the pandemic and into 2023 I am looking forward to the MRA Winter Business Meeting and the Spring Conference and the opportunity to see so many of you face to face. These meetings allow us to showcase what the MRA provides to its members and develop strategic initiatives. There is great networking, hospitality suites, training events and storytelling; and providing these opportunities is also not easy work.

The wonderful thing I have seen in SAR is how selfless and hardworking so many of you are. As in every SAR team, the hard work of the MRA is inevitably done by a dedicated few. These are our leaders. As the MRA leans into inclusion, leadership development, and the professionalization of our volunteer organizations, I want to acknowledge and praise all our hardworking MRA members, especially the leadership, for their outstanding efforts. I also want to challenge them to *train their replacements*.

At last year's Estes Park conference there was much discussion and multiple presentations on leadership

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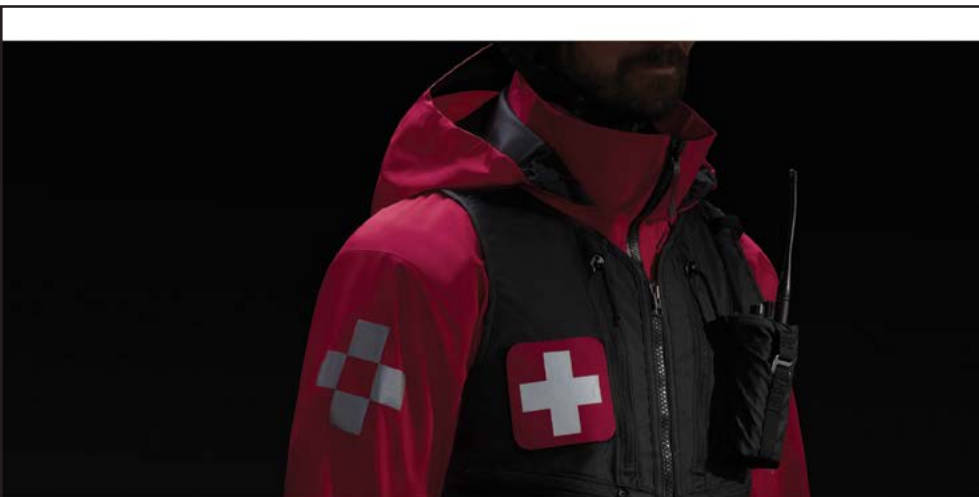
development. High quality, thoughtful mentorship is a vital skill in a leader. No one lasts forever. Promoting advancement in an organization is investing in its future and longevity. It motivates newer members and gives them goals. It helps prevent stagnation.

As you read this consider where you fit in your SAR team (and the MRA). Just getting started? Look to the

leaders you admire and reach out for advice or suggestions on where your energies would be most helpful. Middle management? Ask the expert to help you develop your weaknesses. Use your strengths to improve team performance. Already leadership? Don't be intimidated by the new talent. Mentor them and help them advance; it gets you closer to retirement! If you love what you are doing but are not ready to retire, please consider mentoring your successors anyways. Share your knowledge and experience, support growth and innovation. You may leave a legacy, like saving a life.

Alison Sheets

President, Mountain Rescue Association



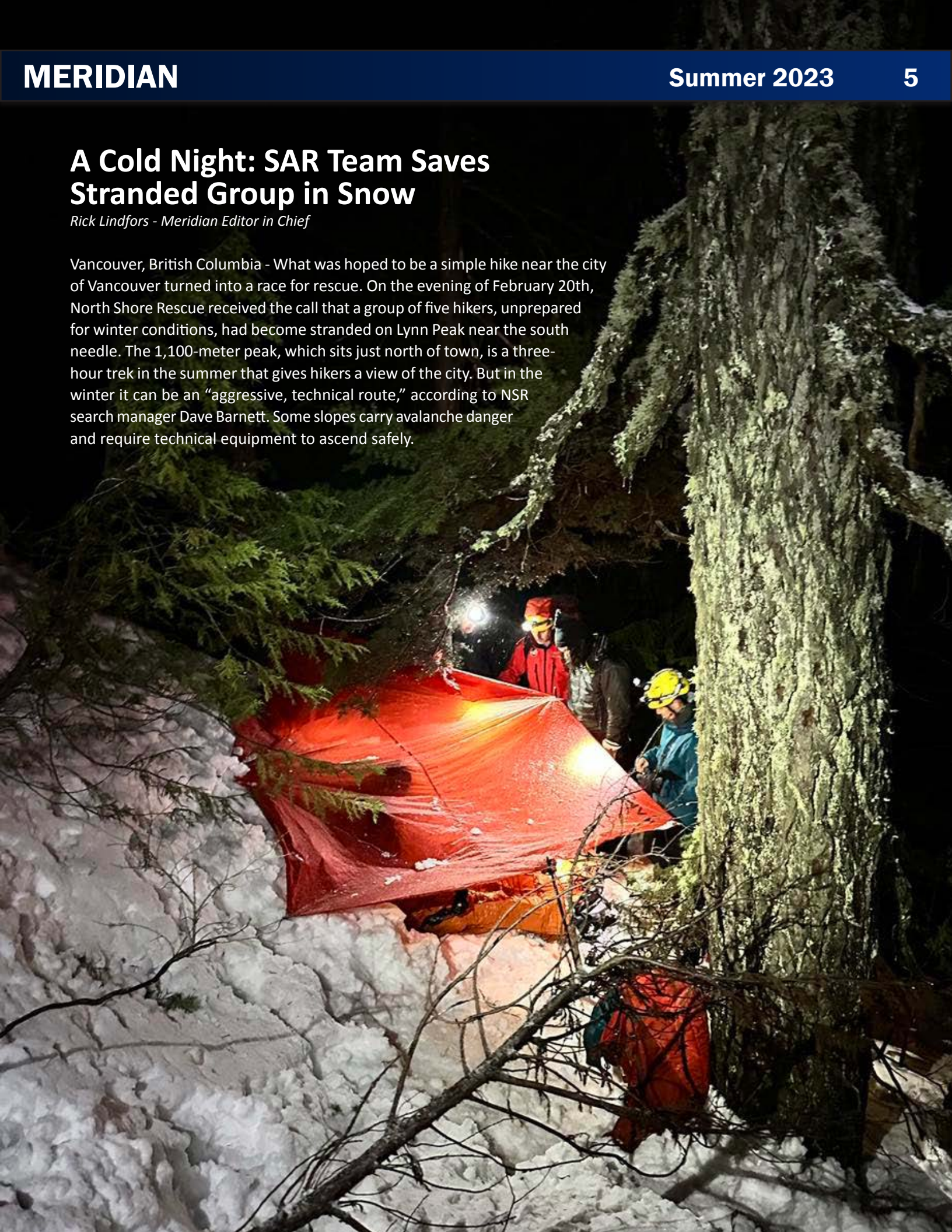
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A Cold Night: SAR Team Saves Stranded Group in Snow

Rick Lindfors - Meridian Editor in Chief

Vancouver, British Columbia - What was hoped to be a simple hike near the city of Vancouver turned into a race for rescue. On the evening of February 20th, North Shore Rescue received the call that a group of five hikers, unprepared for winter conditions, had become stranded on Lynn Peak near the south needle. The 1,100-meter peak, which sits just north of town, is a three-hour trek in the summer that gives hikers a view of the city. But in the winter it can be an "aggressive, technical route," according to NSR search manager Dave Barnett. Some slopes carry avalanche danger and require technical equipment to ascend safely.



"[The group] did a few things right. They called, stayed together and stayed in their location after calling for help," said Barnett, "they also let their family know where they were going." But besides the communications, the hikers were not prepared for winter conditions. They did not have the right clothing or footwear for the snow. "They shouldn't have been in that area in the first place. They weren't familiar with it and weren't trained for those kinds of conditions," he added. No one in the group had a headlamp and they drained their phone batteries by trying to use them as a light source.

Two NSR teams hiked in from Hydraulic Creek to the Lynn Peak trail. They located the group two and a half hours later on a steep slope. The teams set up a rope system in order to safely descend and examine the subjects and set up a shelter. They found two of the five subjects were showing symptoms of hypothermia and likely would not be able to walk themselves out. The team decided that those two would need helicopter extraction. Before they could hoist them out, they placed the two subjects in harnesses and moved them up the slope to a clear space.

NSR works with Talon Helicopters on rescue missions across their coverage area. NSR has volunteers who are trained to hoist subjects to safety. The unit is one of only a few in British Columbia that can fly night rescue missions. The first attempt at extraction was unsuccessful due to low cloud cover, however the weather cleared a few hours later allowing both hypothermic subjects to be evacuated. Both were brought back to the incident command post where they were assessed then released by paramedics. The rest of the team walked out with NSR volunteers, finishing the mission by 0400.

NSR pushes for hikers to be prepared when going outside, even to areas that are close to Vancouver. The mission could have been easily avoided had the subjects in this case turned around after hitting conditions they weren't prepared for. NSR tries to help people be prepared through social media campaigns as well as in-person events. Barnett says they get called at least once a week to speak at events for preventative search and rescue and have a dedicated public education group for such events. The team does 40-50 events per year. While there are clear



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examples of what to do and not do in the wilderness, Barnett says they need to be careful to avoid laying blame on rescued subjects when detailing the circumstances around missions.



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The challenge of the rescue professional is the need to adapt, especially when facing unexpected situations. In order to be ready for the unexpected, members of the Davis County Search and Rescue team train often in places like Farmington Canyon, Utah.



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Outdoor Climbing Injuries: Patterns and Risks

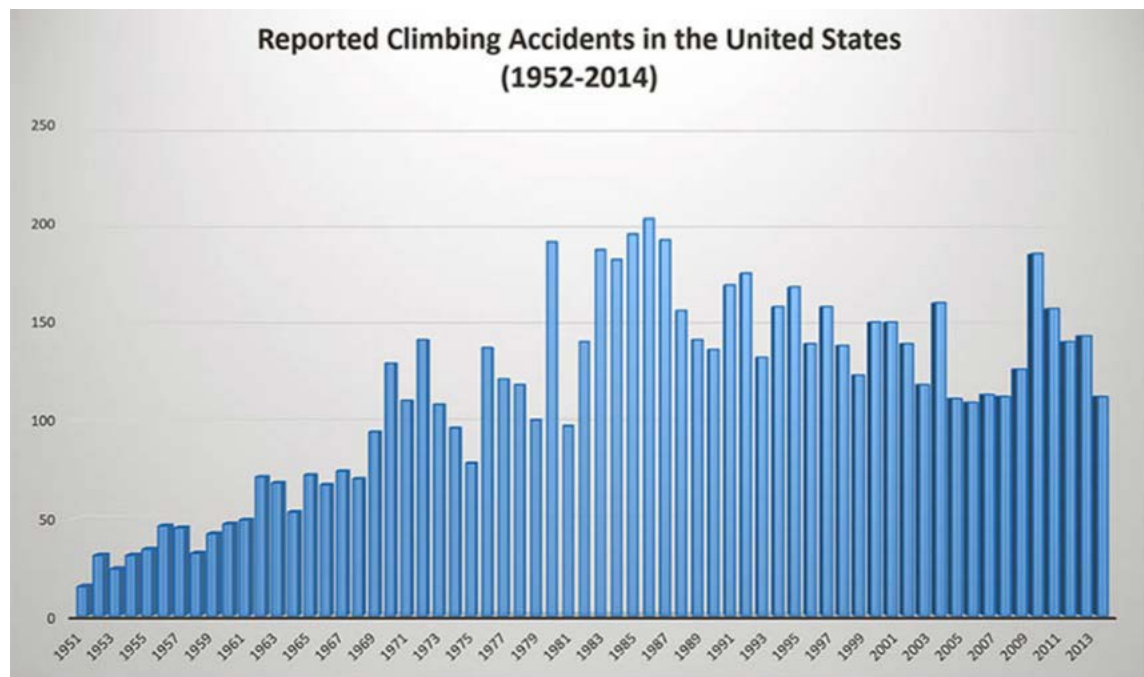
Cassie Lowry, DO FAWM
MRA MedCOM

Climbing, in its many forms, has grown in popularity across the country at an estimated 67% increase since 1998. As outdoor sports continued to grow in popularity during the COVID pandemic, the frequency of injuries is likely to have increased as well. Many of the largest data sets predate the pandemic, but smaller studies recently released have consistently demonstrated similar conclusions.

Within the sport of climbing itself we can see trends in the injuries that lead to hospitalization of the athletes and pose the greatest safety challenges to these athletes and likewise the rescuers called to tend to them in the

field. These insights provide tangible benefit for preventative education to the athletes, their advisors, and the climbing and rescue community. In a larger effort, it also provides the bases for the rescue community to serve wilderness recreationalists by continuing to support that education.

Familiarity with trends and unique injuries related to the sport may also provide specific insight to rescuers while caring for these patients and teams in high yield parts of the country in preparing for the warmer months when these numbers generally uptrend.



Nelson, Nicolas G., and Lara B. McKenzie. "Rock Climbing Injuries Treated in Emergency Departments in the U.S., 1990-2007." *American Journal of Preventive Medicine* (2009).



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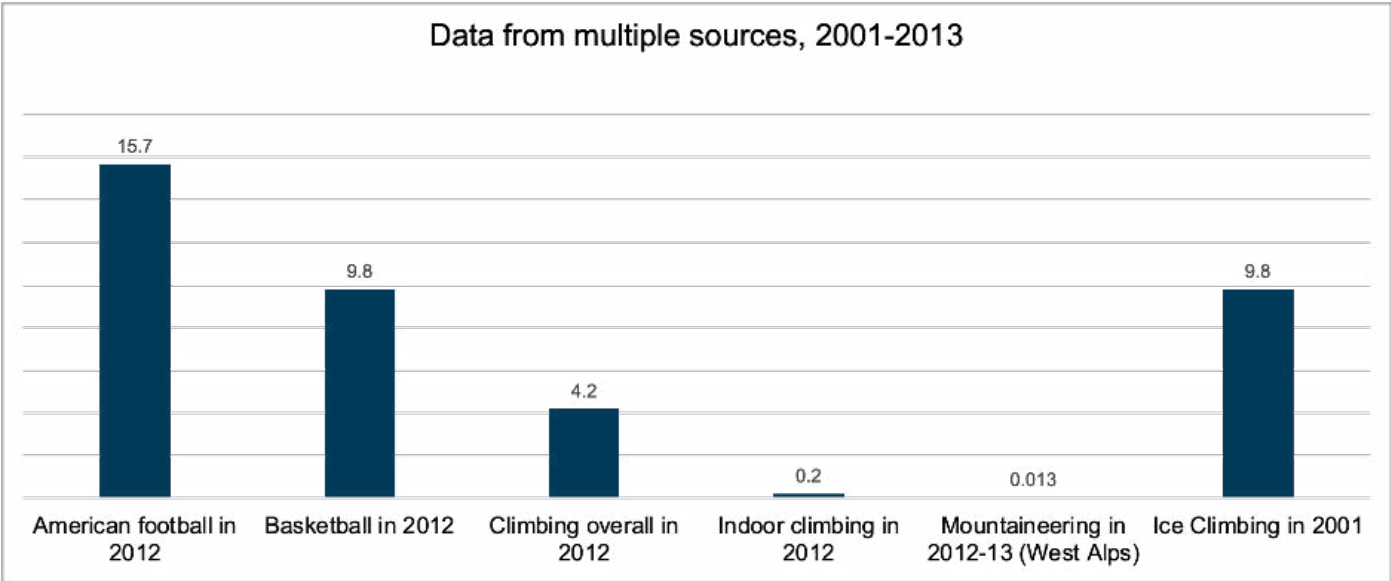
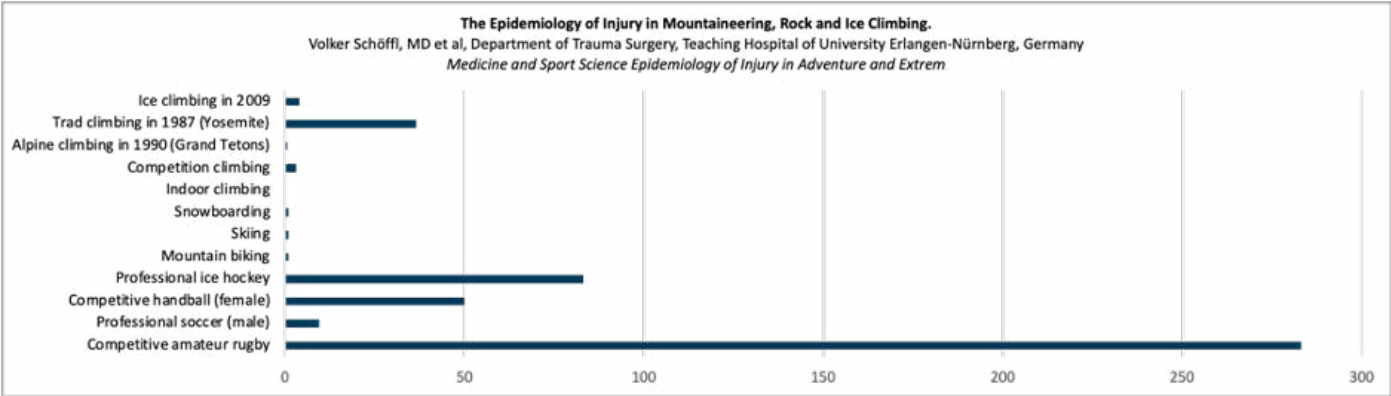
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The data on climbing gathered from a massive study published in 2012 suggests that it poses less injury-per-1000-hour risk than other popular sports such as basketball, rugby, or skiing, however retrospective data on sport-specific injuries and fatalities are not reported in a standardized manner so monitoring injury patterns and

risk remains challenging, especially regarding recommendations for preventative measures. But in general, climbing can be consider less dangerous in this sense than other sports as it is maybe not quite as “extreme” as it’s been regarded in the past, especially with advances in equipment and technique over the past few decades.



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Different forms of climbing also demonstrate different trends in rates, severity, and fatality of injuries within the sport as a whole. Mountaineering athletes, for instance, demonstrate higher rates of head and spine injuries as well as higher grade traumas and poly-traumas, while sport and alpine climbing see a high incidence of lower limb injuries, primarily fractures, sprains, and strains. Not surprising, alpine climbing sees greater risk than sport or “crag” climbing due to a larger number of objective hazards encountered in the sport similar to mountaineering but overall less risk in a general sense than mountaineering. A large 30-year retrospective analysis published in 2020 by the American Alpine Club also demonstrated the highest injury rates and severity in alpine and ice climbing.

Variance in Injury Type by Climbing Sport

Mountaineering: higher grade trauma, multiple fractures, severe wounds, poly-traumatic patients.

- Head and spine
- Lower > upper extremities
- Torso

Ice climbing: skin lesions and open wounds, hematoma, other, frost bite, fractures.

- Head
- Upper extremities

Alpine climbing: fractures, strains, sprains.

- Lower extremities

Sport climbing: fractures, strains, sprains.

- Upper extremities: finger > arm > hand
- Lower extremities: feet > legs > perineal

(Schöffl, et al. "The Epidemiology of Injury in Mountaineering, Rock and Ice Climbing." Medicine and Sport Science Epidemiology of Injury in Adventure and Extreme Sports. 2012)

THE RISKS IN CLIMBING

The AAC data from the 2020 report also found a significant one third of reported injuries (865 out of the 2,724 climbing

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incidents) occurred during descent. Fatal accidents were most associated with rappel errors and unroped climbing, and like other studies discussed below there was consistently a strong correlation between lack of helmet use and severity of injury. A 1988 study from Yosemite also showed that experienced climbers were most likely to be significantly injured, however with the volume influx of new climbers this trend may or might already be shifting.

Although less than 12% of climbers evaluated in emergency departments in one data set reviewed were hospitalized for their injuries, most of them were due injuries related to falls. Notably, climbers were ten times more likely to be admitted for injuries obtained from falls from greater than twenty feet (which included both “whippers” and “decking”), illustrating a significant and tangible risk of serious injury related to this kind of exposure which is a common in lead climbing and unroped climbing including bouldering, free climbing, and free soloing.

Mechanisms of Climbing Injuries in 31,116 Cases Presenting to U.S. Emergency Departments

Falls: 77.5% of total cases.

- Many resulted in foot fractures (most common fractured body part in the study overall).

1/3 of total falls evaluated were from height of 20' or more accounting for 70% of the total hospitalizations in the study. Of those cases, compared to falls from less than 20'

- Hospitalization: 10x more likely
- Fractures: 3x more likely
- Truncal/torso injuries: 2x more likely

Hitting and/or striking an object e.g. impact or contact injury on a sharp piece of rock: 7.1% of total cases.

- Ankle: 2x more likely to be involved.
- Accounted for most of the lacerations in the study.

Being hit and/or struck by an object e.g. falling gear or dislodged rocks: 6.4% of total cases.

- Data on helmet use not available.
- Involved mostly:
 - ♦ Lacerations
 - ♦ Head or face injuries
- Disposition:
 - ♦ Hospitalization: 3x more likely.

Overexertion e.g. felt "a pop" while performing a move: 3.1% of total cases.

- Involved mostly upper extremities and hands.

(Nelson & McKenzie. "Rock Climbing Injuries Treated in Emergency Departments in the U.S., 1990–2007." American Journal of Preventive Medicine. 2009)

The principle risk with falling is the impact on the descent or rapid halt of that motion. Not all falls can be completely mitigated by nature of the environment, however technique is



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consistently emphasized in the sport to reduce the probability of a greater distance during a fall and to avoid complications relating to gear. Most authors of the studies reviewed agreed that increased helmet use would arguably decrease the severity of injuries obtained by climbers and mountaineers, but the greatest risk across all forms of climbing is a significant fall.

The risk and consequence of head injury and blunt trauma are greatly increased by falling inverted. Helmets are not 100% protective but may reduce the severity of head injury, depending on impact forces.

INJURY PATTERNS

Over-exertion or stress injuries may be avoided with proper technique, warm-ups, and stretching. Stress injuries unique to climbing include torn pulley tendons in the fingers, hamate fractures in the hands, and proximal hamstring strains which infrequently require evacuation but fractures

and injuries related to falls were very common in the data sets examining climber injuries that were evaluated in emergency departments.

The most common injuries over all to require emergency evaluation have been fractures, strains, and sprains, and the vast majority of injuries sustained in climbing do end up in hospitalization. Injuries from landing on or impalement by gear are less common but the consequence can range from minor tissue damage to devastating neurological damage or paralysis. Reaching for carabiners or the rope during a fall increases the risk of rope burns, impalement, unclipping, and getting appendages caught in the rope as it coils and uncoils which can result in degloving and amputations.

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Climbing Injuries in 14,147 Cases Presenting to U.S. Emergency Departments, 2012-2014

Disposition:

- Evaluated and treated in critical access or low-acuity medical centers: 38.8%
- Discharged from the ED: 88.3%
- Admitted to the hospital for their injuries: 7.7%
- Transferred to higher level of care e.g. Level 1 Trauma Center: 3.2%

Most common diagnoses:

1. Fracture: 28.3%
2. Strain or sprain: 25.3%
3. Soft tissue: 11.7% (e.g. contusions)

Less common diagnosis:

- Internal organ injury: 4.3%

(Nicholson, et al. "Epidemiology of Mountain Climbing Injuries Presenting to Emergency Departments in the United States from 2012 to 2014." *Wilderness & Environmental Medicine*. 2016)

Climbing Injuries in 40,208 Cases Presenting to U.S. Emergency Departments, 1990-2007

Disposition:

- Discharged from the ED: 88.5%
- Admitted to the hospital for their injuries: 11.3% (mostly related to falls or torso injuries)

Most common diagnoses:

1. Fracture: 29.0% (mostly feet)
2. Strain or sprain: 28.6% (mostly ankles)
3. Lacerations: 17.1% (mostly head and legs)
4. Soft tissue: 16.9% (e.g. contusions)

Less common diagnosis:

- Dislocations: 4.3% (mostly upper extremities)

(Nelson, Nicolas G., and Lara B. McKenzie. "Rock Climbing Injuries Treated in Emergency Departments in the U.S., 1990-2007." *American Journal of Preventive Medicine*. 2009)

In general, education in the climbing community may be the principle step to reducing the number and severity of preventable injuries that rescuers are called to every year. Mountain rescuers are in a unique position to often have experience that is highly applicable to all types of climbers. Engagement in the climbing community by rescue teams to continue to provide much needed mentorship and support for the ever-growing population of climbers and mountaineers.

Cassie Lowry, DO FAWM (Everett Mountain Rescue) is originally from Washington State, soon relocated to San Diego from Montana. She is a longstanding member of the MRA MedCOM, a committee of medical professionals that writes a quarterly contribution to the Meridian. For questions about anything related to medical issues contact us at medcom@mra.org. Thank you.

Sponsor Spotlight:

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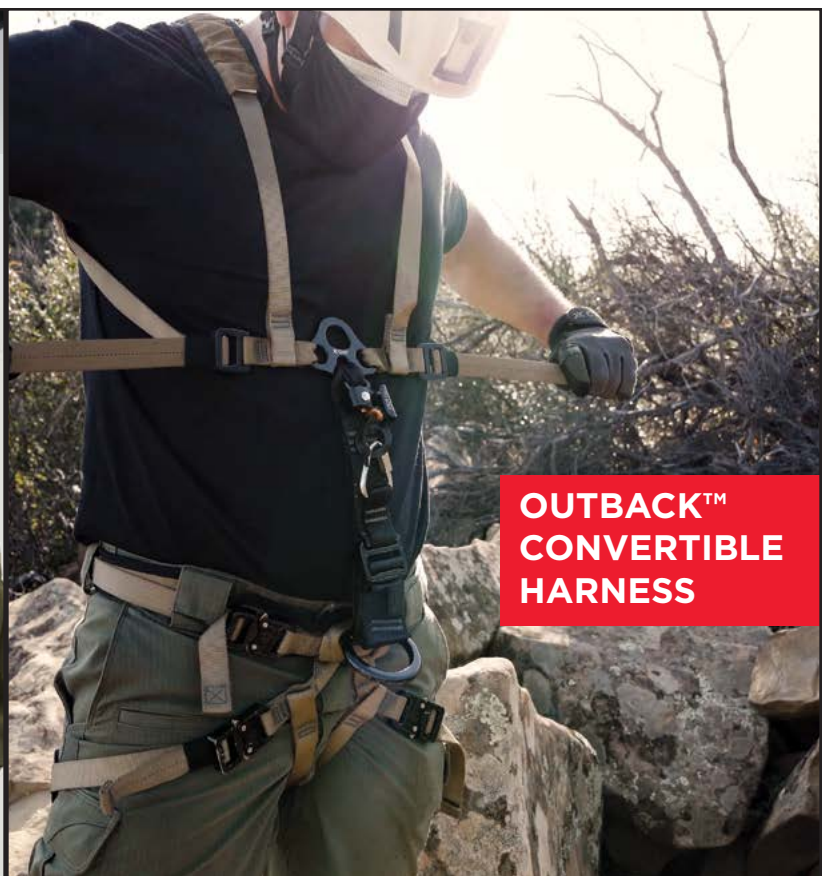
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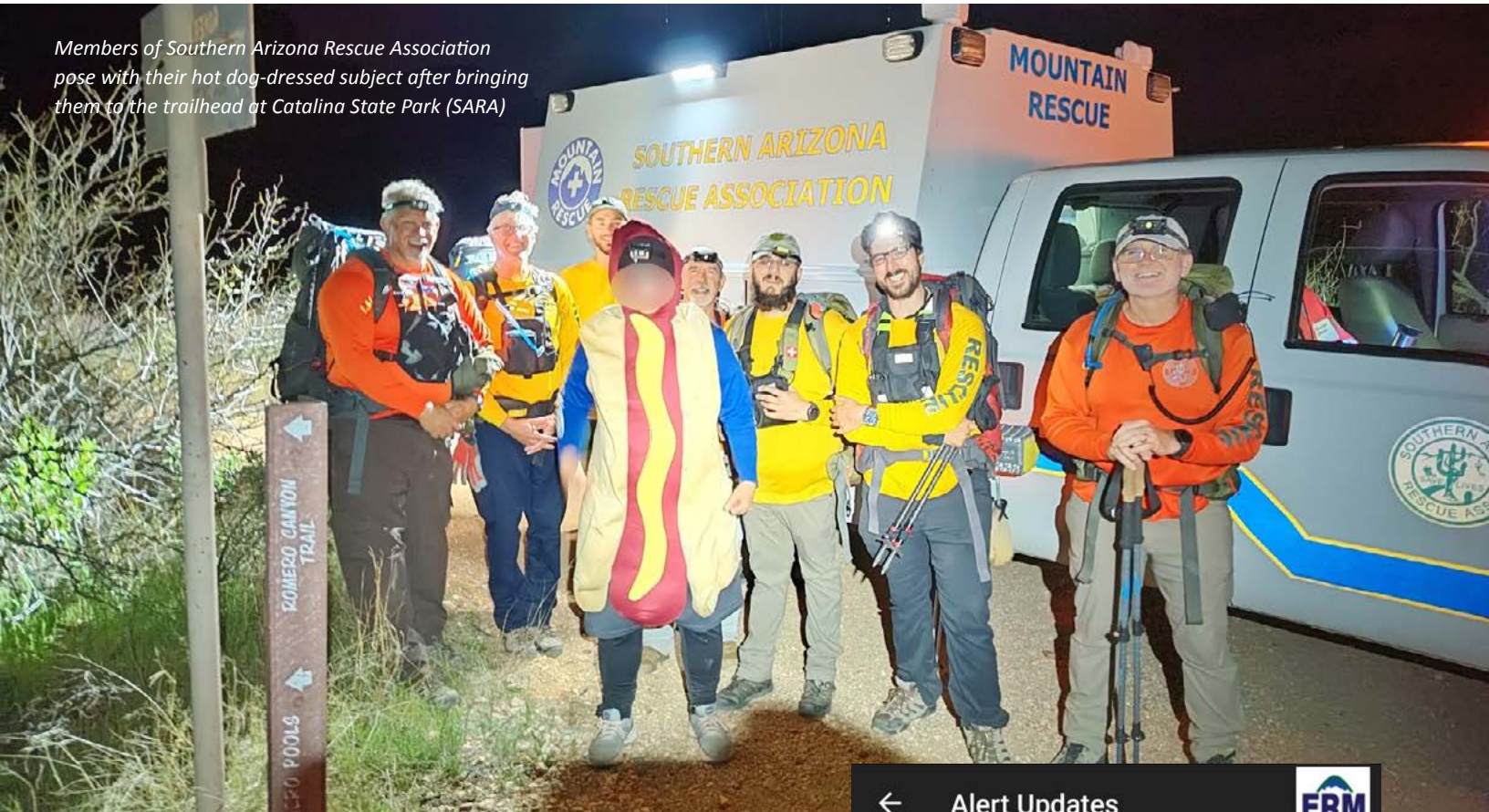


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Members of Southern Arizona Rescue Association pose with their hot dog-dressed subject after bringing them to the trailhead at Catalina State Park (SARA)



Bringing Home the Brat: SAR Team Saves Wandering Wurst

Rick Lindfors - Meridian Editor in Chief

Tucson, Ariz. - In one of the strangest SAR incidents in recent memory, Arizona search and rescue teams found and assisted a hiker who got lost while dressed as a hot dog in Catalina State Park. The hiker, who was attempting a five-day, 100 mile hiking event for charity, found themselves in a pickle after becoming lost and exhausted in rough conditions on the Arizona Trail.

Members of the Southern Arizona Rescue Association received the emergency callout the evening of March 19th and started working their way to coordinates provided by the subject. Additional information later came in about the subject’s getup, which caused some confusion among the teams. According to SARA member Trevor Dickerson, they weren’t mis-hearing the radios; SARA was in fact tasked with rescuing someone who was dressed as a hot dog with mustard.

SARA teams located the subject two hours later near a series of popular natural pools close to the trail. It turned out they had become lost after hiking for twelve hours in conditions ranging from snow at high altitude to warmer areas with several water

Alert Updates

ERM

3/20/2023 2:25 AM	Cancel All out. Hiked out with pt - Joe B
3/19/2023 11:42 PM	Romero: Teams with subj ~1/4 mi above pools. Providing fluids, fuel and light and will be hiking out. No further assistance needed. -782
3/19/2023 10:57 PM	Romero: Subj description. Dressed as a hot dog (with mustard). -782
3/19/2023 9:23 PM	Search Meet: Catalina State Park Female subject lost above Romero Pools. Coordinates on map already. Need a team of 4 to hike in and retrieve her. She is described as exhausted, possibly needs some fuel. -Sean Fawcett
3/19/2023 9:13 PM	Romero : Subject Location (4 meter accuracy) 32 24.858,-110 52.308 - Stephen F PCSD

The Emergency Response Manager Screen for SARA showing the updated subject description including condiments (SARA)

crossings. Fortunately they were not injured and were able to continue back to the trailhead after a medical assessment, rest and food. "This was, without question, the most memorable call of my time with SARA," said Dickerson.

The [Hot Dog 100](#) raises money for the local food bank. Participants dress up as hot dogs and then walk for the cause. With the mission being a success and the subject safe and sound, it is safe to assume that SARA will relish this operation for years to come.



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Letter from the Editor

The essential personality traits for a search and rescue volunteer include determination, problem solving, grit and perhaps most important is a sense of humor. There is plenty to laugh about in our trade from harmless training mishaps (yours truly has spent quite a bit of time strapped into a litter and pressed into a cliff wall) to having to go rescue someone dressed as a hot dog, as SARA did this year.

Humor is also a strong coping mechanism for us when we go through the more brutal affairs of SAR. There are some days with the worst weather, others with the worst mission circumstances. Being able to find the right one-liner or other bright side to a bad situation can at times be critical for ourselves and our teammates, but certainly isn't a replacement for proper psychological first aid and peer support. Always keep a good eye on your teammates and identify what they need, whether it's a quick humor trip or a deeper conversation about what they're going through. This kind of support is critical to maintaining mission readiness and ensuring that your team members want to continue being a part of your group.

Cheers,

Rick Lindfors
Meridian Editor in Chief
Northstar Search and Rescue



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